APPENDIX 4

DEMILITARIZATION REQUIREMENTS FOR ITEMS LOCATED WORLDWIDE

ITEM 1. SMALL ARMS WEAPONS, PARTS, AND ACCESSORIES (CATEGORY 1 - MUNITIONS LIST)

a. All nonautomatic, semiautomatic, and automatic guns and other weapons up to and including 50 caliber; shotguns; shoulder fired grenade launchers; rocket launchers, man portable; individually operated weapons which are portable and/or can be fired without special mounts or firing devices and which have potential use in civil disturbances and are vulnerable to theft; pyrotechnic pistols and other ground signal projectors; component parts for the aforementioned items; accessories, i.e., silencers and mufflers, rifle grenade launchers, riflescopes and all types of telescopic and optical sights including those designed for night sighting and viewing, bayonets and gunmounts (including bipeds and tripods); insurgency-counterinsurgency type firearms or other weapons having a special military application (e.g., close assault weapons systems) regardless of caliber and all components and parts, therefor.

b. Key points to be demilitarized: Entire items and parts thereto (except wooden stocks, leather products and nonmetallic material which may be disposed of without demilitarization).

c. Method and degree of demilitarization

(1) FOR ITEMS LISTED IN PARAGRAPH a ABOVE (except accessories), the preferred (normal) method of demilitarization under local expanded demilitarization procedures is by torch cutting utilizing a cutting tip that displaces at least one-half inch of metal. All cuts will completely sever the item and be made in accordance with instructions applicable to the items being demilitarized as depicted in appropriate figures contained in appendix 7. Shearing, crushing, deep water dumping or melting maybe utilized when such methods of demilitarization are deemed more cost-effective and/or practicable and are authorized by appropriate authority,

(a) RECEIVERS will be demilitarized by torch cutting in a minimum of two places utilizing a cutting tip that displaces at least one-half inch of metal or crushed to the extent necessary to preclude restoration to a usable condition.

(b) BOLTS AND BARRELS will be demilitarized by torch cutting utilizing a cutting tip that displaces at least one-half inch of metal or crushed to the extent necessary to preclude restoration to a usable condition.

(c) OTHER METALLIC PARTS, including M2 conversion kits (figure 68), will be mutilated by crushing, cutting or melting.

(2) MACHINE GUNS will be demilitarized by torch cutting utilizing a cutting tip that displaces at least one-half inch of metal or shearing the receiver in a minimum of two places or by crushing in a hydraulic or similar type press. The barrel will be torch cut, sheared or crushed in the chamber area and in two or more places to the extent necessary to prevent reconstitution. If the shearing or crushing method is used, the trunnion block and side frame must be completely cut through, broken or distorted to preclude reconstitution.

(3) MAGAZINES will be demilitarized by cutting, shearing or crushing. Clips for M1 rifle do not require demilitarization.

(4) ACCESSORIES, i.e., silencers and mufflers, rifle grenade launchers, riflescopes and all types of telescopic and optical sights including those designed for night sighting and viewing, bayonets and gunmounts (including bipeds and tripods) will be demilitarized by breaking, crushing or cutting in a manner which precludes restoration to a usable condition in accordance with instructions applicable to the items being demilitarized as depicted in appropriate figures contained in appendix 7.

d. As an alternative method of demilitarization, any complete weapons, repair parts and key points included in this item 1 which are small enough to fit in the furnace at RIA without cutting, may be demilitarized by melting as outlined in chapter III, in the same manner as weapons and parts included in item 1 above. Exception is made to equilibrators and recoil mechanisms which will not be demilitarized by melting. The dimensions of the furnace firebox at RIA are: 4 feet 6 inches in diameter by 4 feet deep.

ITEM 2. ARTILLERY AND PROJECTORS (CATEGORY II - MUNITIONS LIST)

a. Guns over caliber .50; howitzers; cannons; mortars; tank destroyers; grenade and rocket launchers other than man portable types, recoilless rifles; torpedo tubes; aircraft external stores; pylons; launchers and ejector/release racks; Navy gun mounts, Navy gun turrets, and shipboard rocket launchers; mounts and carriages for guns over caliber .50, howitzers, mortars, recoilless rifles; and military flame throwers and projectors.

b. Key points to be demilitarized: Tubes and gun barrels, launching rails, receivers, breechblocks, breech chambers, breech couplings, breechrings, breech housings, breechyokes, breechplugs, trunnion blocks, firing mechanisms, release mechanisms, equilibrators, recoil mechanisms, torpedo tube muzzle and breechdoors, turret rings, armor plate, flame thrower operating mechanisms, gun mounts and carriages.

c. Method and degree of demilitarization

NOTE: The figures mentioned below are illustrated in appendix 7.

(1) BREECHRINGS, BREECH CHAMBERS, BREECH COUPLINGS, BREECH BLOCKS, BREECH HOUSINGS, BREECH YOKES, BREECHPLUGS AND FIRING MECHANISMS (of guns and howitzers) will be cut through with the breechblock in the closed position (figure 1) and through the firing mechanism (figure 2). Equivalent cutting of the breechring, breech chambers (figure 3), breechblock, and firing mechanism as separate items is acceptable.

(2) ALL 20MM GUNS will be demilitarized by torch cutting utilizing a cutting tip that displaces at least one-half inch of metal in accordance with figures 38,39, and 40, to include, as applicable:

(a) One cut through body of the receiver to the rear of the cradle with bolt assembly remaining in the weapon if furnished with the assembly.

(b) One cut through the heavy portion of the barrel, the gas operating system and recoil spring.

(c) Torch the chamber opening in the barrel and forward portion of-the bolt, if assembled in weapons, sufficiently to create a metal puddle.

(d) The 20MM feeder will be demilitarized by cutting, shearing, or crushing.

(e) Weapon accountability will be dropped on a unit basis after demilitarization has been completed.

(3) RECEIVERS (30MM guns) will be cut into three sections by cutting through the barrel support section, with a second cut through the slideways.

(4) ROCKET LAUNCHERS AND GRENADE LAUNCHERS extruded and cast aluminum construction lend themselves to destruction by crushing. Crushing will be accomplished by hydraulic or similar press or by placing on a hard surface and flattened by a steel track crawler type vehicle.

(5) RECEIVERS (CASING) (40MM GUN) (figure 4) will be cut completely through the casing body assembly near the rammer tray.

(6) BARRELS (GUNS AND HOWITZER) will be cut into two pieces, the cut being made as near the point of origin of the rifling as possible but not more than one-third of the barrel length from the breech face of the tube (figure 5). Combat vehicle artillery will be cut just in front of the mantelet or shield (figure 17).

(7) TRUNNIONS, TRUNNION BEARINGS, AND TRUNNION BEARING CAPS (not disassembled) will be cut completely through diagonally.

(8) MORTARS will be cut by torch or crushed (figure 6).

(a) When cutting method is used, the tube will be cut into two pieces, the cut being made one-third of the length of the tube from the cap end. The cap will be cut into three pieces, the cut being made diagonally through the cap.

(b) When the crushing method is used, the mortar tube will be crushed (inner surfaces of the tube touching) for a distance of 8 inches, extending from base cap end toward muzzle end of tube. The base cap will be crushed until the largest diameter of cap is out of round by a minimum of 1 inch.

(9) ROCKET LAUNCHERS, including rails, will be cut, crushed, or broken to render them nonreclaimable.

(10) MILITARY FLAME THROWER MECHANISMS will be cut, crushed, or broken.

(11) HYDROPNEUMATIC RECOIL AND EQUILIBRATOR MECHANISMS. WARNING: Demilitarization of recoil mechanisms and equilibrators must be accomplished by qualified personnel only.

(a) Prior to release of hydropneumatic recoil or equilibrator mechanisms (which in a broad sense

includes counter-recoil (recuperator) mechanisms) to a DRMO, reserve oil will be drained and nitrogen pressure released by technically qualified personnel in accordance with instructions in the pertinent technical manuals.

WARNING: Oil and nitrogen release valves and drain plugs will be left open during cutting operations.

(1) If the nitrogen pressure cannot be released due to a faulty valve, a one-eighth inch hole will be drilled by technically qualified personnel in the wall of the nitrogen cylinder 6 inches from the nitrogen end (figure 8) to release the pressure.

WARNING: Extreme caution should be exercised while drilling the hole in the nitrogen cylinder wall. A suitable safety shield should be used to protect personnel from the drill shavings that are expelled from the hole when drill enters the nitrogen cylinder. Protection should also be provided for eyes, face, arms, and hands of personnel performing the operation.

(2) To prevent a possible internal buildup of oxygen and acetylene in the nitrogen cylinder during cutting operations, a one-half inch hole will be drilled 6 inches from the end of the nitrogen cylinder (figure 8). To perform this operation on the 155 MM, 175MM and 8-inch howitzer mechanisms, a section of the cover or housing must be cut away. (NOTE: If a one-eighth inch hole has been drilled (subparagraph (1) above), enlarge this hole to one-half inch.)

(b) Enlarge the one-half inch hole with a gas-cutting torch by removing a section of at least 2 square inches from the nitrogen or recuperator cylinder as shown in figures 8 and 9.

NOTE: If qualified explosive personnel are available, a satisfactory hole can be made by the use of shaped charge instead of drilling and cutting with a torch.

(c) The recoil rod and counter-recoil rod, if present, will be cut completely through and flush with the recoil and counter-recoil cylinder (figure 10). Hydropneumatic equilibrators such as those on the 155MM and 175MM guns and 8-inch howitzers will be cut as shown in figure 11.

(12) HYDROSPRING RECOIL AND EQUILIBRATOR CYLINDER

(a) Drain off oil from hydrospring recoil cylinders. On hydrospring cylinders, cut through cylinder lengthwise, the cut to be 4 inches or more in length and of sufficient depth to cut through at least two coils of the spring (figure 12). Concentric-type recoil mechanisms will be cut through the cradle in the most accessible area, the cut to be of sufficient length and depth to cut at least two coils of the spring (figures 13 and 14).

WARNING: Hydrospring recoil and equilibrator mechanisms contain springs under high pressure; therefore, extreme caution must be exercised. Demilitarization must be performed by technically qualified personnel only. No attempt should be made to cut the cylinder in two pieces without prior release of spring tension.

(b) In the case of the 40MM automatic gun, proceed as in subparagraphs (1) through (4) below:

(1) Remove the two drain plugs near the front of the recoil cylinder(s) and drain the recoil oil.

(2) At a point just behind the recoil cylinder attaching bracket, cut completely through tube of casing body assembly, recoil cylinder(s), and barrel assembly(s) (if barrel is installed on gun).

(3) Open top cover(s) and cut longitudinally through top portion of breech ring(s) and breechblock(s).

(4) At a point between the front and rear loader guides, cut completely through breech casing body(s) and tray(s) (figure 7).

(c) In the case of the 37MM automatic gun, cut completely through the gun tube and counter-recoil (recuperator) mechanism and cut completely through the middle of the trunnion bearing, trunnion, and trunnion bearing cap at a 45 degree angle.

(13) SPRING-TYPE EQUILIBRATORS such as the type used on the 105MM howitzers of the M2-series will be cut through both inner and outer spring shown in figure 12.

(14) TORPEDO TUBES

(a) If the ship is to be scrapped in the United States:

(1) The breechring will be removed by cutting or sawing from the torpedo tube barrel. The point of cut in the barrel will be approximately 6 to 12 inches forward from face of breechring.

(2) All muzzle and breechdoors will be cut into two pieces of approximately equal sizes.

(b) If the ship is to be scrapped outside the United States:

(1) Remove the breechdoor and cut in half.

(2) Remove the rotating breechlocking ring and cut in half.

(3) Cut the breech end of the tube approximately 6 to 12 inches from the breechface.

(4) Secure the muzzle door operating shaft against movement by pinning it in place.

(15) GRENADE PROJECTOR MOUNTS, GRENADE MOUNTS, as used in M551 armored reconnaissance airborne vehicle will be demilitarized by cutting to destroy the firing solenoid (figures 15 and 16).

(16) NAVY GUN MOUNTS, NAVY GUN TURRETS AND OTHER ARMORED ITEMS. Cut armor into at least four approximately equal sized pieces to destroy integrity. Cut turret rings in two places.

(17) TOP CARRIAGES AND BOTTOM CARRIAGES, MOUNTS, AND OUTRIGGERS will be cut through below the trunnion bearings.

(18) AIRCRAFT EXTERNAL STORES will be punctured to create a hole no smaller than 12 inches in diameter and connecting points (to the wing/fuselage) will be completely mutilated.

(19) PYLONS AND EJECTOR/RELEASE RACKS will be demilitarized as shown in figures 52 and 53.

ITEM 3. AMMUNITION, MILITARY EXPLOSIVES, SOLID AND LIQUID PROPELLANTS, AND INCENDIARY AGENTS, (CATEGORIES 111, IV, AND V - MUNITIONS LIST)

a. Military explosives; pyrotechnics (except those having dual military and commercial use); all compounds specifically formulated for items in this category; ammunition; ammunition components; military fuel thickeners and missile propellants. Includes missile ground handling equipment designed to transport solid or liquid propellants (fuels and oxidizers). Boosters, primers, incendiary agents, fuzes and components therefore; detonating devices for ammunition; ammunition manufacturing and loading machines (except hand loading); all hand grenades and similar items of all types, including but not limited to high explosive (figure 65), practice, inert, incendiary, smoke, tear gas, other chemical, and sectional grenades.

NOTE Expended cartridge/shell cases over 30MM will be demilitarized in accordance with subparagraph c(1) below in the United States, Puerto Rico, the Virgin Islands, American Samoa, Guam, and the TTPI only if they are known to be defective. Expended cartridge and shell casings, caliber .50 and under, require demilitarization prior to export from the U.S. only.

b. Key points to be demilitarized: Explosives, pyrotechnics, propellants, propellant fillers, cartridges, cartridge and shell cases and casings. Toxic material, rotating bands, incendiary or smoke content, other military design features, and features determined hazardous to the general public. For grenades and ammunition manufacturing and loading machines - entire item.

c. Method and degree of demilitarization: As economically as practicable in accordance with existing environmental standards, safety, and operational regulations, to the point of assuring freedom from explosives, pyrotechnics, propellants, propellant fillers, toxic or incendiary materials, smoke content or design hazard. For ammunition procured by the Department of the Army, technical instructions relating to ballistic missiles, large rockets, and ground handling equipment, as published in the MICOM Series 43 Technical Manuals, will be furnished by the Commander, U.S. Army Missile Command, ATTN: AMSMI-LC-ME-PP, Redstone Arsenal, AL 35898-5239; for conventional, chemical, and all other types of ammunition and Ammunition Peculiar Equipment (APE), excluding lethal chemical agents and material, by the U.S. Army Armament, Munitions and Chemical Command, ATTN: AMSMC-DSM, Rock Island, IL 61299-6000; for chemical agents and materials including vesicants, and nerve agents and their carriers, by the U.S. Army Program Manager for Chemical Demilitarization, ATTN: SAIL-PM, Edgewood Arsenal, Aberdeen Proving Ground, MD 21010-5401. For ammunition procured by the Department of the Navy, technical instructions will be issued by the Commander, Naval Sea Systems Command or by the Commander, Naval Air Systems Command, Department of the Navy, Washington, DC, whichever has technical control of the item. For ammunition procured by the Department of the Air Force, technical instructions will be issued by the Engineering and Reliability Branch (MMWR), Ogden Air Logistics Center, Ogden, UT 84056-5609.

NOTE: The figures mentioned below are illustrated in appendix 7.

(1) ARTILLERY/MORTAR AMMUNITION COMPONENTS AND SIMILAR ITEMS OF All TYPES (figures 55 through 58) including, but not

limited to, high explosive, practice, inert loaded, incendiary, and smoke fillers. Remove explosive filler from projectile (washout, burnout, etc.). Remove rotating band or score or deform bourrelet or gas check band or deform fuze cavity threads. Burn propellant unless otherwise instructed to retain for sale or other purposes. Deform fin assembly threads or fin blades. Cartridge cases (not returned to ICP designated contractors) will be deformed by off-center punch-out of primer or split case neck or puncture the lower sidewall with a minimum of three-fourths of an inch hole or deform lower sidewall, which will prevent cambering, or crush or press. Burnout smoke mixture or detonate smoke canister.

(2) BOMBS AND SIMILAR ITEMS OF ALL TYPES, including but not limited to high explosive, practice, inert loaded, incendiary and photoflash fillers. military explosive excavating devices, demolition blocks and grenades. Demilitarization can be accomplished by removal of explosive filler in an approved manner; e.g., washout, burnout, etc. Deform fuze cavity threads or remove base plate by other than normal disassembly (such as sawing) or detonate.

(3) SMALL EXPLOSIVE ITEMS, including, but not limited to, fuzes (figures 59 and 60), boosters, primers, detonators, firing devices (figure 61), ignition cartridges, blasting caps, grenade cartridges, tracer assemblies and similar components. Demilitarization can be accomplished by processing through a deactivation furnace at settings of 1150 degrees at burner end and 450 to 500 degrees at stack end or by mutilation. Incendiary projectiles will normally be decored to expose and assist in the complete burning of the incendiary composition. Where decoring of projectile is not necessary, processing through the deactivation furnace is adequate. Burnout 20MM HE projectiles by processing through the deactivation furnace or detonate. Processing complete small arms ammunition cartridges, all calibers, through the deactivation furnace at controlled temperatures will result in adequate demilitarization. Fuzes and boosters can be disposed-of by disassembly and cutting, drilling, or punching to deform metal parts. Explosive components generated through disassembly are to be burned or detonated. Fuzes may also be processed through a deactivation furnace as a complete item when disassembly is not feasible. For grenades demilitarization may be accomplished by removal of explosive components by crushing, cutting, breaking, melting, burning, or otherwise to fully preclude their rehabilitation or further use as grenade components. Demilitarization may also be accomplished by detonation or burning as appropriate for the particular item involved or by deep water dumping at sea.

(4) UNUSED LINKS (figure 62) AND OTHER NONEXPLOSIVE FILLED ITEMS which perform a major function essential to the basic mission of the end item. Cut, crush, or process through a deactivation furnace. Burn or cut cartridge case lines and propelling charge bags. Cut, crush burn, or crush aircraft and ground signal cases. Crush or detonate piezoelectric (lucky) elements. Crush, cut or deform threads as appropriate on stabilizer tube or fin of grenade adapters; rifle grenade fin assemblies; stabilizer tube-fin assembly, rifle grenade; rifle grenade ogive; rocket launchers (figure 63), mine arming plugs, shape charge stand-offs and similar items.

(5) ROCKET MOTORS, WARHEADS, COMPONENTS AND SIMILAR ITEMS OF ALL TYPES, including high explosive, inert loaded, practice and smoke. Washout or burnout rocket warhead filler and mutilate casing by crushing or cutting by torch or deforming threaded area. Disassemble and remove or burn out rocket motor propellant and cut, crush case, or deform threaded area of cases. Rocket motors and warheads may also be detonated.

(6) MINES, ANTI-PERSONNEL/ANTI-TANK (figure 64), EXPLOSIVE COMPONENTS AND SIMILAR ITEMS OF ALL TYPES including high explosive, practice, inert loaded and associated explosive components. Washout or burnout filler and mutilate casing by crushing, cutting by torch, deforming threaded area or detonate. Process mine fuzes, activators, and firing devices through a deactivation furnace, burn in a cage or detonate. Mine firing devices such as the M56 or M61 types should be crushed, cut, or burned.

(7) INERT LOADED AMMUNITION, PROJECTILES, WARHEADS AND SIMILAR ITEMS OF ALL TYPES loaded with inert filler to simulate service item. Remove rotating band from artillery projectiles and open the closure of the projectile body to expose the inert filler. On items without rotating bands, open the body closure to expose the inert filler and damage the closure surface to prevent reloading or resealing.

NOTE: For inert loaded bombs (concrete, sand, plaster) a potential explosive safety hazard exists when the internal filler is not exposed or unconfined during burning, melting or cutting. Heat generated from a demilitarization process can cause the filler, moisture and air to expand and burst sealed casings. For this reason, DRMOS will not accept inert loaded bombs unless the internal filler is exposed and unconfined. The internal filler may be exposed by removal of the fuze well from the cavity, removal of base plates, or by puncturing/drilling holes in the bomb casing.

ITEM 4. LAUNCH VEHICLES, GUIDED MISSILES, BALLISTIC MISSILES, ROCKETS, TORPEDOES, AND COMPONENTS (CATEGORY IV - MUNITIONS LIST)

a. Launch vehicles and missile and antimissile systems including, but not limited to, guided, tactical and strategic missiles, launchers and systems; rockets (including, but not limited to, meteorological and other sounding rockets); torpedoes and depth charges, as well as launchers for such defense articles; missile and space vehicle powerplants; apparatus, devices and materials for the control, activation, detection, protection, discharge or detonation of launch vehicles, guided missiles, ballistic missiles, rockets, and rocket torpedoes; ablative materials; nonnuclear warheads; specifically designed key components, parts and accessories, attachments and associated equipment for the above.

b. Key points to be demilitarized: For components, parts, accessories, attachments and associated equipment for the above - entire item. Otherwise as indicated below.

c. Method and degree of demilitarization: As economically as practicable in accordance with existing environmental standards, safety and operational regulations, to the point of assuring freedom from explosives, toxic or incendiary materials, smoke content or design hazard. For items procured by the Department of the Army, technical instructions relating to demilitarization of guided and ballistic missiles, warheads, large rockets, and associated equipment will be furnished by the U.S. Army Missile Command, Redstone Arsenal, AL 35898-5239; for all other types of ammunition except lethal chemical agents "and materiel by the Commander, U.S. Army Materiel "Readiness Command, Rock Island, IL 61299; for lethal chemical agents including vesicants and nerve agents and their carriers by the U.S. Army Armament Material Readiness Command Program Manager for the Demilitarization of Chemical Materiel; Edgewood Arsenal, Aberdeen Proving Ground, MD 21010. For items procured by the Department of the Navy, technical instructions will be issued by the Commander, Naval Sea Systems Command or by the Commander, Naval Air Systems Command, Department of the Navy, Washington, DC, whichever has technical control of the item. For items procured by the Department of the Air Force, technical instruction will be issued by the Engineering and Reliability Branch (MMWR), Ogden Air Logistics Center, Ogden, UT 84056.

MISSILES

(a) Remove and dispose of all classified equipment as directed for item 9. Remove and dispose of explosive charges as directed for item 4.

(b) Destroy the airframe to airframe section (stage) attaching fittings, leveling and aligning fittings, engine mounts (where applicable), ground handling and launching fittings. Destruction may be accomplished in such a manner as to preserve the utility of the fuel tanks to the extent possible. The tail and forward skirt assemblies, transition assemblies, between tank structure and tail fairing assembly (engine mount section) will be completely mutilated to prevent restoration and assembly. Completely destroy the gyros, accelerometers, and other peculiar electronic equipment in the guidance system and all target selection programming data. Completely destroy the ablative shell, impact detectors, and wire or printed circuitry in the missile and reentry vehicle. Destruction may be accomplished by cutting with a torch, shearing, crushing, or melting.

CAUTION. All tanks, lines and fittings will be thoroughly decontaminated by technically. qualified personnel before proceeding with demilitarization of the airframe.

ITEM 5. VESSELS OF WAR AND SPECIAL NAVAL EQUIPMENT (CATEGORY VI - MUNITIONS LIST)

a. Warships, including nuclear powered versions, and including any ship originally built as a warship but later modified to a different configuration (warships include, but are not limited to, aircraft" carriers, cruisers, battleships, destroyers,

destroyer escorts, submarines, and various configurations of such ships. A list of these types of ships is included under the heading 'Warships" in the Defense Reutilization and Marketing Manual, DoD 4160.21-M, chapter VIII, attachment 9); amphibious warfare vessels; mine warfare vessels; experimental types of naval vessels; turrets and gun mounts; missile systems; arresting gear; special weapon systems; protective systems; catapults; other components, parts attachments and accessories specifically designed for the following types of combatant vessels: battleships, command ships, guided missile ships, cruisers, aircraft carriers, destroyers, frigates, escorts, minesweepers, and submarines; minesweeping equipment and components, parts, attachments and accessories specifically designed therefor; Naval nuclear propulsion plants, their land prototypes, and special facilities for their construction, support and maintenance. This includes any machinery, device, component, or equipment specifically developed, designed or modified for use *in* such plants or facilities.

b. Key points to be demilitarized: Armament, hulls, plane arresting cables, applicable items designated in this attachment, and other items designated by the Naval Systems Commands or other procuring Military Services/Defense Agencies.

c. Method and degree of demilitarization

(1) WARSHIPS: Armament will be demilitarized as prescribed for items 1 and 2, above. Hulls will be demilitarized by scrapping, except, with respect to destroyers and destroyer escorts, the portion of the hull to which the power plant is attached need not be cut.

(2) OTHER COMBATANT SHIPS, including but not limited to, amphibious warfare ships, landing craft, landing vehicle, tracked, mine warfare vessels, same as warships, except hulls do not have to be demilitarized by scrapping.

(3) OTHER ITEMS designated in this appendix will be demilitarized as prescribed by the appropriate- Naval Systems Commands or other procuring Military Services/Defense Agencies.

ITEM 6. TANKS AND MILITARY VEHICLES (CATEGORY VII - MUNITIONS LIST)

a. Tanks of all types; military recovery vehicles; gun carriers; other military type armed or armored vehicles; military railway trains; vehicles specifically designed or modified to accommodate mountings for *arms or* other specialized military equipment or fitted with such items; combat engineer vehicles; bridge launching vehicles; half-tracks; self-propelled guns and howitzers; amphibious vehicles, engines specifically designed or modified for the vehicles above.

b. Key point to be demilitarized: Armament and armor on all vehicles; for engines, entire item.

c. Method and degree of demilitarization

NOTE: The figures mentioned below are illustrated in appendix 7.

(1) Armament will be demilitarized as prescribed for items 1 and 2, above. Demilitarization of main armament (such as gun, howitzer, mortar or rocket launcher) on combat vehicles may be accomplished on the vehicles (figure 17) or after removal from the vehicles.

(2) All hinge-mounted items (such as doors, ramps or hatches) will be removed from the vehicle prior to cutting the hull.

(3) For vehicles with turrets and/or cupolas, the turret and/or cupola will be cut into two sections as shown in figure 17 and removed prior to cutting the hull.

(4) The top section of the hull on all vehicles will be cut into four sections without affecting the suspension, as shown in figures 17, 18, and 19. To accomplish the hull cuts, a complete circumferential cut will be made at or just above the track or wheel level and cuts will be made across the top of the hull from the front center to the rear center (longitudinal) and from the left side center to the right side center (transverse).

(5) A rectangular section of the hull front armor plate, starting at the circumferential cut and extending to the floor line, will be removed. The width of the section will be determined by making the widest cut possible without affecting the suspension.

ITEM 7. MILITARY "AIRCRAFT (COMBAT, TACTICAL AIR VEHICLES), SPACECRAFT AND ASSOCIATED EQUIPMENT (CATEGORY VIII - MUNITIONS LIST)

a. Aircraft which are designed for offensive or defensive military operations, e.g., gunnery, bombing, rockets and missile launching; designated training aircraft; experimental and developmental aircraft and drones; spacecraft, including manned and unmanned; active and passive satellites; military aircraft and spacecraft engines specifically designed or modified and designated by the procuring military service; cartridge-actuated devices utilized in emergency escape of personnel; and airborne equipment (including, but not limited to, airborne refueling equipment specifically designed for use with military aircraft, spacecraft and missiles); inertial navigation systems and components designed specifically for such systems; ground effect machines (GEMS) specifically designed or modified for military use including, but not limited to, surface effect machines and other air cushion vehicles, and all components, parts, and accessories, attachments, and associated equipment specifically designed or modified for use with such machines; nonexpansive balloons in excess of 3,000 cubic feet capacity, except such types as are in normal sporting use; and associated armament and aircraft subsystems consisting of guns, turrets, grenades, external store pylons, all launchers, ejectors/release racks, (figures 52 and 53, appendix 7), fire control and related equipment.

NOTE The term aircraft does not include aircraft designed and used only for cargo and personnel carrying or dropping, observation, trainers as designated, and commercial type helicopters and other aircraft suitable for commercial or nonmilitary purposes either "as is" or after removal of military characteristics. The inventory control point will designate aircraft which are to be demilitarized prior to disposition, and those aircraft which may be sold after removal of military design characteristics.

b. Key points to be demilitarized

(1) AIRCRAFT fuselage, tail assembly, wing spar, armor, armament and armament provisions, explosives (includes explosive bolts and squibs), classified items, missile ablative shell, impact detectors and circuitry, missile guidance systems, and target selection programming data, and missile ground handling equipment.

(2) SPACECRAFT. (See subparagraph c(2).)

(3) ENGINE TURBINE WHEEL AND SHAFT ASSEMBLY OF TURBOJET AND TURBOPROP ENGINES. Excepted are the turbine wheel and shaft assembly of turboprop and turboshaft engines, and components and accessories in common with aircraft authorized for sale and commercial use, ignition system, fuel system including the variable area nozzles or fuel spray systems, as applicable, and engine mounting fittings of ram-jet and pulse-jet engines, thrust chamber, turbine pump, balanced material orifices, gas generator (when used) and engine mounting fittings of rocket engines.

(4) CARTRIDGE-ACTUATED DEVICES, entire item.

(5) INERTIAL NAVIGATION SYSTEMS. (See subparagraph c(4).)

(6) GROUND EFFECT MACHINES. (See subparagraph c(4).)

(7) NONEXPANSIVE BALLOONS. (See subparagraph c(5).)

(8) ASSOCIATED ARMAMENT, EQUIPMENT AND SUBSYSTEMS will be demilitarized by cutting, breaking, crushing, melting or dumping at sea or as covered elsewhere in this appendix.

c. Method and degree of demilitarization

(1) MILITARY AIRCRAFT

(a) Fixed wing single and multiple engine aircraft. The area where the wing attaches and becomes a part of the fuselage structure will be mutilated in a manner to completely sever the wing spar to make it unfit for flight. The empenage (tail assembly) will be destroyed by mutilating the horizontal and vertical stabilizer attaching fittings area in such a manner as to make it unfit for flight. The fuselage will be destroyed by severing an area (normally at the production break) between the wing and empennage. (See figures 49 and 50, appendix 7.)

(b) Attack helicopters. Helicopters designed specifically for attack purposes will be demilitarized by mutilating the transmission deck in area of mounts, engine deck in area of mounts, landing gear fittings, attaching structure wing to fuselage fittings, fuselage section to fuselage section, and tail rotor gear box mounting structure. (See figure 51.)

NOTE: Airframe (fuselage) will be mutilated by destroying attaching structure by cutting, chopping,

tearing, shredding, crushing or smelting to the degree that aircraft will be unfit for repair or flight.

(c) Destruction, as specified above, will be accomplished by cutting, chipping, chopping, tearing, shredding, crushing, smelting, or bailing in a manner to preclude restoration to its original condition. Armament will be destroyed as specified for items 1 and 2 above. Explosives, including explosive bolts and squibs, will be disposed of as specified for item 4. Classified items will be disposed of as prescribed for item 9.

(2) SPACECRAFT: As indicated by the procuring military service.

(3) ENGINES

(a) Turbojet and turboprop engines. Remove the turbine wheel and shaft assembly from the engine and cut a segment (two or more "fir trees") from turbine wheel bucket splines. Sever the shaft at the wheel end bearing point. When multistage turbines are involved, only the shaft and last stage turbine wheel need be demilitarized. In cases where it is not economically practicable or feasible to remove the turbine wheel and shaft assembly from the engine, gain access to them by entering through shroud either by removal or cutting hole in shroud.

(b) Ram-jet and pulse-jet engines. Completely destroy key points listed in subparagraph b(3) above.

(c) Rocket engines. Completely destroy key points listed in subparagraph b(3) above.

(4) INERTIAL NAVIGATION SYSTEMS AND GROUND EFFECT MACHINES: Specific instructions and technical guidance will be furnished by the procuring Military Service/Defense Agency upon request.

(5) NONEXPANSIVE BALLOONS: Specific instructions and technical guidance for demilitarization will be furnished by the Commander, Naval Air Systems Command, Department of the Navy, Washington, DC 20361-4120, upon request.

(6) ASSOCIATED ARMAMENT, EQUIPMENT AND SUBSYSTEMS

(a) Gun barrels, launcher barrels, tub tubes or pods, receivers, firing mechanisms, except nonmetallic parts which may be disposed of without demilitarization (figures 42,43,44, 45, and 47).

(b) Rotor assemblies, delinking feeders, electric drive assemblies and mounts (figures 44, 46, and 48).

(c) Ammunition containers, crossover assemblies, magazines and chute assemblies.

(d) Controllers, intervalometers, electric components assemblies, gunner control panel, pilot wing control panels and reflex sights.

ITEM 8. MILITARY TRAINING EQUIPMENT (CATEGORY IX - MUNITIONS LIST)

a. Military training equipment includes but is not limited to attack trainers, radar target trainers, radar target generators, gunnery training devices, antisubmarine warfare trainers, target equipment, armament trainers, pilotless aircraft trainers, mobile training units, military type link trainers, operational flight trainers, flight simulators, radar trainers, instrument flight trainers and navigation trainers.

b. Components, parts, accessories, attachments and associated equipment specifically designed or modified for the articles in subparagraph a.

c. Key points to be demilitarized

(1) All classified material as outlined in item 9.

(2) All other military operating equipment incorporated in military training equipment is to be demilitarized in accordance with the methods and degree of demilitarization shown in items 1 through 17, as applicable.

ITEM 9. CLASSIFIED MATERIAL (CATEGORY XVII - MUNITIONS LIST)

a. All classified material.

b. Key points to be demilitarized: Those parts and components specified by the cognizant engineering or technical Military Service as being classified for security reasons. Small arms will be demilitarized as prescribed in item 1.

c. Method and degree of demilitarization: In accordance with owning Military Service directives for safeguarding and/or disposal of classified material.

ITEM 10. PROTECTIVE PERSONNEL EQUIPMENT (CATEGORY X - MUNITIONS LIST)

a. Flak-suits (front, back, groin and apron); bullet-proof vests; anti-G suits; anti-exposure suits; radiological control clothing; and equipment designated in appropriate Military Service/Defense Agency publications and similar items of personal body armor which may be worn or concealed under clothing. This does not apply to steel helmets and flak curtains. Safety and rescue filter units;

vehicular mounted and fixed collective protection equipment and field shelter ventilating systems, including gas/gas particulate filters and canisters, air filtering respirators and air respirator cartridges; protective and toxicological, biological and radiological masks.

b. Key points to be demilitarized

(1) Filtration systems - canister/filter and entire filter unit.

(2) Protective masks - canister/filter element, face piece.

(3) All other items listed - entire item.

c. Method and degree of demilitarization

(1) Canisters and filters will be demilitarized as economically as practicable in accordance with existing environmental standards, safety and operational regulations, to the point of assuring freedom from toxic and other environmental hazards.

(2) Protective masks will have mouth plug remove from face piece and destroyed or face piece may be slashed.

(3) All other items require complete destruction beyond possible use, repair or restoration. This will be accomplished by cutting, burning or crushing.

ITEM 11. MILITARY AND SPACE ELECTRONICS (CATEGORY XI - MUNITIONS LIST)

a. Electronic equipment assigned a military designation including radar, radar gunsighting and bombsighting equipment, target and missile control receiving and transmitting equipment (including ground control and interception equipment, antijammers and test equipment peculiar thereto); emergency radio receiver-transmitter equipment and beacons designed to operate on peculiar military, interagency or international distress signal frequency (8364 KCS, 500 KCS, 121.5 MC, 282.8 MC and 243.0 MC), e.g., survival radios, AN/URC-4, AN/URC-10, AN/URC-11, AN/U RC-64, AN/PRC-90, AN/PRC-103, AN/PRC-106 comprising types RT159A/URC-4, RT159B/URC-4, RT285/URC-11, RT285A/URC-11, and radio beacons AN/URT-21, 27, 33, AN/CRT 3, etc.; IFF (Identification Friend or Foe) receiver transmitters and associated equipment; items which incorporate TEMPEST technology; electronic warfare systems (active and passive); countermeasures surveillance and counter-countermeasures equipment; underwater sound, doppler equipment and communications-electronic equipment; electronic equipment specifically designed or modified for spacecraft or space flight or for use with military systems; and key components, parts, accessories, attachments and associated equipment specifically designed for use *or* currently used with the item, to include equipment which incorporates TEMPEST technology, except such items as are in normal commercial use; all types of chaff Electronic Countermeasure (ECM) and associated equipment.

b. Key points to be demilitarized

(1) EMERGENCY RADIO RECEIVER TRANSMITTERS AND BEACONS: Remove and dispose of separately the following crystals: Types CR-24/u and CR-56/u capable of transmitting on 500 KC, 8634 KC, 121.5 MC, 243.0 MC and 282.8 MC and other types of crystals designed specifically to operate on distress signal frequencies.

(2) IFF RECEIVER TRANSMITTERS AND ASSOCIATED EQUIPMENT: Frequency generators (magnetrons, klystrons), oscillators, tuning coils, radio frequency heads and cavities, printed circuit boards, delay lines and performance data plates.

(3) ELECTRONIC WARFARE SYSTEMS: Transmitters, receivers, and associated circuitry; processors, microprocessors, indicators, RF heads, cavities and logic circuits traveling wave tubes, cathode ray tubes, klystrons, oscillators, noise generators, and magnetron tubes or solid state devices; modulation circuits, frequency sensitive RF components, antennae, waveguides, and identification plates or decals that reveal any military offensive or defensive advantage; for chaff - entire item.

(4) ALL OTHER MILITARY AND SPACE ELECTRONICS: Frequency generators (magnetrons, klytrons), oscillators or indicators, wave guides, modulators, synchronizers, receiver-transmitters, encoders and decoders, radio frequency heads, computers, cavities, antenna horns, identification and performance data plates or decals.

c. Method and degree of demilitarization

(1) EMERGENCY RADIO RECEIVER TRANSMITTERS AND BEACONS: Remove and destroy crystals from receiver-transmitter. Condition tags and turn-in documents must show that crystals are to be removed prior to donation or disposal "to the public. Radio beacons will be crushed or otherwise

mutilated to preclude further use of the item for its intended purpose.

(2) ELECTRONIC COUNTERMEASURES - CHAFF

(a) Nonexplosive chaff: The preferred method is by melting or briquetting. When melting or briquetting is not economical or practical, items will be completely neutralized by cutting into small segments, or crushing (as with a tracked vehicle) so as to break the packing, wrapping, or sleeve from the chaff and cause complete derangement of the dipole sequence.

(b) Explosive chaff

(1) Remove and dispose of the explosive charge as directed for item 4, and neutralize the dipole sequence of the chaff as prescribed for nonexplosive chaff.

(2) Detonate. Technical instructions will be furnished as prescribed for item 4.

(3) ITEMS WHICH INCORPORATE TEMPEST TECHNOLOGY

(a) If the TEMPEST application is to an item which is specifically designed for military use - complete destruction to preclude restoration as an item for its original function (this includes both entire end items and individual components, as applicable).

(b) If the TEMPEST application is to a commercially available item, e.g., IBM-XT or AT personal computer, the generating activity will sanitize the equipment of all classified/sensitive data and software prior to turn-in to the DRMO. The turn-in document will be annotated that item has TEMPEST application and has been sanitized prior to turn-in. These items will then be considered Strategic List Items and incorporate all appropriate controls.

(4) ALL OTHER ITEMS: Complete destruction of key points to preclude restoration or remanufacture as an item for its original function. Demilitarization will be accomplished by cutting, crushing or breaking.

WARNING: Cathode ray tubes will be broken only in accordance with procedures approved by local safety personnel.

ITEM 12. FIRE CONTROL, RANGE FINDER, OPTICAL AND GUIDANCE AND CONTROL EQUIPMENT (CATEGORY XII - "MUNITIONS LIST)

a. Fire control systems; gun and missile tracking and guidance systems; range, position and height finders and spotting instruments; aiming devices (electronic, gyroscopic, optic and acoustic); bomb sights and bombing computers; military television sighting units; inertial platforms; periscopes; inertial guidance systems; astro compasses; star trackers; gun-laying equipment; infrared night sighting and viewing equipment, including but not limited to, image intensifiers, laser and other electro-optical night sighting and viewing equipment (includes sniperscopes, weapon sights, binoculars, etc.), military masers and lasers, and FDA exempted lasers; key components, parts and accessories for articles in this category, except items as are in normal commercial use.

b. Key points to be demilitarized __

(1) INFRARED NIGHT SIGHTING AND VIEWING EQUIPMENT: Optical elements, tubes and detectors, optical filters and housing and weapon mounting brackets.

(2) ALL OTHER ITEMS

(a) Electronic components. As designated by the procuring service.

(b) Nonelectric items. Entire item.

c. Method and degree of demilitarization:

(1) INFRARED NIGHTSIGHTING AND VIEWING EQUIPMENT: Cutting, crushing, breaking or melting to the degree required to preclude repair or restoration to original intended use.

WARNING: Personnel engaged in demilitarization of this material should be aware of possible presence of self-luminous radioactive sights and coatings on certain optics. Demilitarization will be performed only in accordance with procedures approved by local safety personnel.

(2) ALL OTHER ITEMS

(a) Electronic components. As directed in item 11, paragraph c above.

(b) Nonelectric items. Destroy the item to the degree required to preclude repair or restoration; make sure that all lens or other optical components are completely destroyed.

ITEM 13. AUXILIARY MILITARY EQUIPMENT (CATEGORY X111 - MUNITIONS LIST)

a. Cryptographic devices and software (encoding and decoding) and components specifically designed therefor, ancillary equipment and protec-

tive apparatus specifically designed or modified for such devices, components and equipment; armor plate and structural materials (including, but not limited to, plate, rolled and extruded shapes, bars and forgings, castings, welding consumables, carbon/carbon metal matrix composites) specifically designed or modified for defense articles; devices embodying particle beam and electromagnetic pulse technology; metal embrittling agents.

b. Key points to be demilitarized: Entire item.

c. Method and degree of demilitarization: Items will be destroyed by cutting, burning, breaking, crushing, etc., as appropriate, to preclude restoration for further use as an item or for identification and association of related parts.

ITEM 14. TOXICOLOGICAL, BIOLOGICAL, AND RADIOLOGICAL AGENTS AND EQUIPMENT (CATEGORY XIV - MUNITIONS LIST)

a. Toxicological, biological, and radiological agents which are determined to be hazardous and which have no value in industry or the civilian economy and which are adapted for use in war to produce death or disablement in human beings or animals or to damage crops; and equipment for the dissemination, detection, decontamination and identification of and defense against those agents; to include individual/collective protection equipment; nuclear radiation detection and measuring devices, manufactured to military specifications. Toxicological agents will be considered to include chemical agents such as lung irritants, vesicants, lacrimators, sternutators and irritant smoke and nerve gases.

b. Key points to be demilitarized: Entire item.

c. Method and degree of demilitarization: In accordance with existing environmental, safety and operations regulations prescribed by the inventory control point to the point of assuring freedom from hazard. Technical instructions for toxicological and biological agents and equipment will be furnished as prescribed for item 4 above. Technical instructions for radiological agents and equipment will be furnished by the following persons or organizations within the Military Services having overall knowledge and responsibility for disposal of radioactive material within their respective services.

(1) Army - Commander, U.S. Army Armament, Munitions and Chemical Command, ATTN: AMSMC-DSM, Rock Island, IL 61299-6000.

(2) Navy - Primary Support Bureau, Command or Office.

(3) Air Force - San Antonio Air Logistics Center, ATTN: MMIA, Kelly Air Force Base, TX 78241-5000.

(4) Marine Corps - Commandant of the Marine Corps (Code LMA-3), Washington, DC 20380-0001.

(5) Defense Logistics Agency (DLA) - Appropriate Defense Supply Center initiating the procurement contract.

ITEM 15. NUCLEAR WEAPONS DESIGN AND TEST EQUIPMENT (CATEGORY XVI(a), (b) and (c) - MUNITIONS LIST)

a. Any article, material, equipment, device, specifically designed or modified for use in the design, development or fabrication of nuclear weapons or explosive devices or the devising, carrying out, or evaluating of nuclear weapons tests or other nuclear explosions, except such items as are in normal commercial use for other purposes; cold cathode tubes such as krytrons and sprytrons.

b. Key points to be demilitarized: See the following subparagraph c.

c. Method and degree of demilitarization: Specific instructions and technical guidance will be furnished by the procuring Military Service/Defense Agency upon request.

ITEM 16. SUBMERSIBLE VESSELS, OCEANOGRAPHIC AND ASSOCIATED EQUIPMENT (CATEGORY XX - MUNITIONS LIST)

a. Submersible vessels, manned and unmanned, designed or modified for military purposes or having independent capability to maneuver vertically or horizontally at depths below 1,000 feet or powered by nuclear propulsion plants; submersible vessels, manned or unmanned, designed or modified in whole or in part from technology developed by or for the U.S. Armed Forces.

b. Key points to be demilitarized: As designated by the procuring Military Service/Defense Agency.

c. Method and degree of demilitarization: As indicated by the procuring Military Service/Defense Agency.

ITEM 17. MISCELLANEOUS ARTICLES (CATEGORY XXI - MUNITIONS LIST)

a. Research and development material; partially complete material including but not limited to forgings, castings, extrusions, and machined bodies, which have reached a stage in manufacture where they are clearly identifiable, and which are a key point or incorporate a key point.

b. Key points to be demilitarized

(1) RESEARCH AND DEVELOPMENT MATERIAL: Such points as required to protect security, design features, and proprietary rights and public health, safety, and welfare.

(2) PARTIALLY COMPLETE MATERIAL: As indicated for the completed item.

c. Method and degree of demilitarization:

(1) RESEARCH AND DEVELOPMENT MATERIAL: Completely destroy the end assembly, if applicable, and mutilate components as required to comply with subparagraph a, above. Destruction of assembly or components will be performed as specified for similar items listed in this appendix by cutting, torching, breaking, shearing, etc., to destroy the identity of the item or component.

(2) PARTIALLY COMPLETE MATERIAL: As indicated for the entire item.